G.M. Donaldson
C. Hyslop
R.I.G. Morrison
H.L. Dickson
I. Davidson

CSCP
Canadian Shorebird Conservation Plan

Canada

102-03202/

Canadian Shorebird Conservation Plan

Garry Donaldson[1]
Colleen Hyslop[1]
Guy Morrison[2]
Loney Dickson[3]
Ian Davidson[4]
(editors)

Canadian Shorebird Conservation Plan
Canadian Wildlife Service

1 - Canadian Wildlife Service, Headquarters, Environment Canada, Hull, QC
2 - Canadian Wildlife Service, National Wildlife Research Centre, Environment Canada, Hull, QC
3 - Canadian Wildlife Service, Prairie and Northern Region, Edmonton, AB
4 - BirdLife International, Quito, Ecuador

A member of the Environmental Conservation family

The Canadian Wildlife Service
The Canadian Wildlife Service of Environment Canada handles wildlife matters that are the responsibility of the Canadian government. These include protection and management of migratory birds as well as nationally significant wildlife habitat. Other responsibilities are endangered species, control of international trade in endangered species, and research on wildlife issues of national importance. The service cooperates with the provinces, territories, Parks Canada, and other federal agencies in wildlife research and management.

For more information about the Canadian Wildlife Service or its other publications, please contact:
Publications
Canadian Wildlife Service
Environment Canada
Ottawa, Ontario K1A 0H3
(819) 997-1095
(819) 997-2756 (fax)
cws-scf@ec.gc.ca
http://www.cws-scf.ec.gc.ca

Cover photo: Red Phalarope pair
G.W. Beyersbergen

Illustrations by Dennet Woodland from Shorebirds of the Chaplin Lake Area, Saskatchewan Wetland Conservation Corporation, 1997, Regina SK.

Published by Authority of the Minister of Environment, Canadian Wildlife Service
© Minister of Public Works and Government Services Canada, 2000
Catalogue No. CW69-15/5-2000E
ISBN 0-662-29112-3
Canadian Cataloguing in Publication Data
Main entry under title: Canadian shorebird conservation plan (Special publication)

Issued also in French under title: Plan canadien de conservation des oiseaux de rivage.

Includes bibligraphical references.

ISBN 0-662-29112-3

Cat. No. CW69-15/5-2000E

1. Shore birds — Canada.
2. Birds, Protection of — Canada.
3. Wildlife conservation — Canada.

I. Donaldson, G. (Garry)
II. Canadian Wildlife Service.
III. Series: Special publication (Canadian Wildlife Service)

QL685.5C32 2000 598.3'3 C00-980297-5

Executive Summary

Canada's national biodiversity strategy calls on government and other stakeholders to attack the causes of biodiversity loss at their source and prevent further endangerment of species. Certainly there is cause for concern for Canadian shorebird species. Fully two-thirds of Canada's shorebird populations show downward trends according to survey data.

No single cause accounts for these declines; clearly the situation warrants concern. Canada has a unique responsibility with respect to shorebirds. For many species, more than half of their breeding range occurs in Canada.

Opportunity exists to cooperate with ongoing conservation initiatives such as the Western Hemisphere Shorebird Reserve Network (WHSRN), U.S. Shorebird Conservation Plan, Partners in Flight, Wings Over Water, North American Bird Conservation Initiative, North American Waterfowl Management Plan, and others.

The plan's vision is for healthy populations of shorebirds to be distributed across their range and diversity of habitats in Canada and throughout their global range. The plan thus recognizes the need to collaborate internationally as well as regionally and locally.

The Canadian Shorebird Conservation Plan has five goals designed to fulfill the needs for research, monitoring, and evaluation as well as conservation, communication, and international linkages. Those goals are:

1. Sustain the distribution, diversity, and abundance of shorebird populations within Canada and restore populations of declining, threatened, and endangered species;

2. Secure and enhance sufficient high-quality habitat to support healthy populations of shorebirds throughout their ranges in Canada;

3. Ensure that information on shorebird conservation needs and practices is widely available to decision makers, land managers, and the public;

4. Ensure that coordinated shorebird conservation efforts are in place, on the ground, throughout the range of Canadian shorebird species;

5. Ensure that shorebird conservation efforts are guided by common principles throughout the Western Hemisphere.

The implementation of strategies aimed at achieving these goals will be overseen by a national working group made up of partners committed to shorebird conservation. A science support team will ensure that actions are based on sound science and will address information gaps.

Table of Contents

Executive summary i

Introduction 1
- The migratory nature of shorebirds 1
- Shorebird species 1
- Declining populations 2
- Canada's unique position 3

The challenges 4
- A question of habitat 4
- Life-history strategy 5
- Adaptability to environmental changes 6
- Institutional challenges 7

The opportunities 8
- The North American Bird Conservation Initiative 8
- A landscape approach 8
- Western Hemisphere Shorebird Reserve Network: an international framework 9
- Community benefits 9

The Canadian Shorebird Conservation Plan 10
- Vision 10
- Mission 10
- Goals, strategies, and results 11

Plan structure 16
- The Canadian shorebird national working group 16
- The CSCP science support team 17
- The NABCI-Canada Council 17
- The steps ahead 17

Acknowledgments 18

References 19

Appendix 1. Estimated population sizes and abundance status for shorebirds in Canada 20
Appendix 2. Summary trend analyses of shorebird populations in North America 22
Appendix 3. The Western Hemisphere Shorebird Reserve Network in Canada 24
Appendix 4. Priority setting system for shorebirds in the United States and Canada 26

Introduction

The migratory nature of shorebirds

The spectacular migrations of shorebirds are one of the greatest biological wonders of the world.

In the Americas, some species, such as the Red Knot *Calidris canutus*, migrate from one end of the hemisphere to the other, moving from breeding grounds in the Canadian Arctic to wintering grounds as far away as Tierra del Fuego at the southern tip of South America. A few populations breeding in the northeastern Canadian Arctic migrate to European wintering grounds, while some species of shorebirds in Alaska and some parts of the western Arctic migrate to wintering sites throughout the Pacific as far south as Australia. Conserving these intercontinental migration systems, through preservation of the hemispheric mosaic of habitats and landscapes on which the birds depend, presents a tremendous conservation challenge at local, national, and international levels.

Photo G.W. Beyersbergen

Flocking shorebirds can aggregate in numbers reaching into the tens or hundreds of thousands such as these Stilt Sandpipers at Pelican Lake, Saskatchewan.

Shorebird species

While all shorebirds share the characteristic of being dependent on wetlands at some stage of their life cycles, they do in fact comprise a highly varied group. In Canada, 75 species have been recorded.

Of those 75 species, 47 species breed or occur regularly within our borders (Appendix 1). Taxonomically, these shorebirds are part of the Order Charadriiformes (shorebirds and seabirds) and include members in four shorebird Families:

- Charadriidae (Plovers): 7 species
- Haematopodidae (Oystercatchers): 2 species
- Recurvirostridae: (Avocets and Stilts): 2 species
- Scolopacidae: 36 species - includes Scolopacinae (Sandpipers and allies, 33 species) and Phalaropodinae (phalaropes, 3 species).

Declining populations

Today it is becoming more apparent that pressures from the increasing human use of land and resources are threatening shorebirds and their migration systems and that conservation measures are urgently needed.

Growing evidence gathered over the past 10–20 years indicates that many shorebird populations are in decline (Morrison et al. 2001a).

Morrison et al. (2001) assessed population trends for 35 species of shorebirds across Canada, based on available data from a number of survey programs. Overall, of the 35 species of shorebirds covered by the analyses (Appendix 2), 28 (80%) were negative: this includes 17 species with statistically significant declines somewhere in their range, 2 showed persistent negative trends. Only one species showed a significant positive trend in part of its range. Many declines appear to be ongoing and widespread. Species such as the Semipalmated Sandpiper have shown significant declines in almost all major analyses that have been conducted. Short-billed Dowitchers, a boreal breeding species, have also shown persistent declines in eastern North America. Other species for which negative trends were suspected, such as the Red Knot, have now been shown to have statistically significant declines. Arctic breeding species such as the Sanderling and Ruddy Turnstone are also showing declining numbers. A major conservation concern exists for the Red-necked Phalarope, which has essentially disappeared from staging areas where it was once extremely numerous in the Bay of Fundy.

Declines have been noted for species using coastal sites and interior habitats, but seem to be most pronounced in the central and eastern areas of North America. No single cause has been found for these declines: a number of different factors are likely affecting shorebird populations such as wetland drainage, pollution, habitat loss and disturbance on the nesting grounds. Different species may be affected by a variety of factors, depending on their life history characteristics and migratory pathways. It is clear, however, that unless these trends are stopped or reversed, shorebirds are at risk.

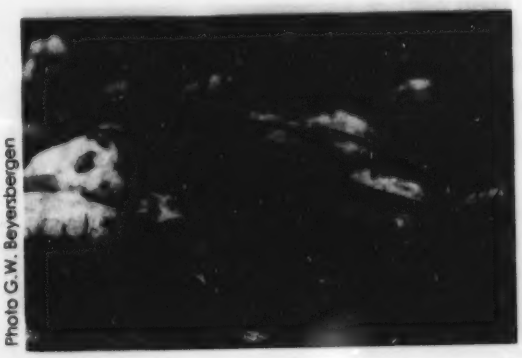


Photo G.W. Beyersbergen

Although currently abundant, numbers of Killdeer are decreasing for reasons that are not yet fully understood.

Canada's unique position

Canada has a particular responsibility with respect to shorebirds. For many shorebirds the Canadian Arctic is of special importance, providing a highly significant proportion of their breeding range in North America.

For 15 species, whose nesting is essentially confined to the Arctic and sub-Arctic, Canada supplies over 75% of the North American/Western Hemisphere breeding range (Appendix 1). Canadian wetlands and coastlines also provide critical migration stopover areas for many shorebirds, as well as winter habitat for a few coastal species.

Canada thus has a strong jurisdictional responsibility to conserve many species of shorebirds and an obligation to do so on behalf of other countries that share these populations. Today there are a number of avenues along which Canada could pursue shorebird conservation actions. Under the Migratory Birds Convention, Canada is committed to work with the United States to conserve shared migratory bird populations. Canada also shares obligations with Mexico under initiatives such as the North American Waterfowl Management Plan (NAWMP). The North American Bird Conservation Initiative (NABCI) promotes integrated conservation for all birds in Canada, the United States and Mexico. In the global context, Canada is working with other countries under the Convention on Biological Diversity, which calls on signatories to preserve the variety of life on earth as an asset to current and future generations. The federal, provincial, and territorial governments share these responsibilities. Many Canadian non-government organizations also have a goal to conserve wildlife and habitats, including shorebirds, on behalf of their supporters.

Photo G. Donaldson

Canadian Arctic landscapes provide breeding habitat for many of the Western Hemisphere's shorebirds. Red Knots and Ruddy Turnstones are common breeders in this river valley in Quttinirpaaq National Park on Ellesmere Island, Nunavut.

The challenges

There are both biological and institutional challenges to effective shorebird conservation. Shorebirds are a diverse group of species and yet are particularly at risk since they share a suite of specialized biological traits. Shorebirds are highly migratory and stage in huge numbers at a limited number of sites during their annual cycle and they have relatively conservative life-history strategies. Consequently, they have a limited ability to respond to environmental changes.

A question of habitat

As part of their annual life cycles, shorebirds make some of the longest migrations known of any animal group. To complete these prodigious cycles, shorebirds depend on networks of wetland and upland habitats that provide the food and resources needed at different times of the year for breeding, migration, and survival.

Northern and temperate breeding habitats provide the resources needed for reproduction, but are often only available for a limited portion of the year. For long-distance migrants, coastal staging areas form a chain of habitats that enable the birds to refuel in preparation for the next leg of the journey. Migration takes them over inhospitable terrain, such as oceans or deserts, where they would be unable to land or survive. Wetlands in the interior of the continent can be variable in terms of water levels and hence feeding opportunities from year to year (Alexander and Gratto-Trevor 1997), but they nevertheless also provide the food and other resources needed for the birds to complete their journeys. The final links in the chain are the wintering grounds, where the birds may spend half the year or more. The continued existence of shorebird migration is thus dependent on the health of wetland ecosystems throughout the birds' ranges.

Most shorebirds are quite dispersed during the breeding season, but many species gather into large concentrations as they move south through migration areas en route to their wintering grounds. The occurrence of a large percentage of the population at one place and time makes the birds particularly vulnerable to habitat losses or other environmental catastrophes (e.g., bait harvesting, oil spills, contamination). Flocking may be important for shorebirds both for finding food and for avoidance of predators, indicating that survival would become increasingly difficult as numbers decline.

The need for conservation planning and action is underlined by the ongoing destruction — or simply alteration — of the habitats and landscapes occupied by shorebirds, both in Canada and elsewhere. Massive wetland losses have already occurred throughout North America, including Canada. Breeding habitats have been destroyed for agricultural production and recreational developments in Canada and abroad, including overwintering habitats in southern latitudes. Although problems are presently less acute in Arctic regions, oil and gas development, mineral exploitation, pollution, and tourism may cause future problems on major breeding grounds. Climate change, with attendant changes in sea level, poses threats to coastal habitats on a global scale.

Actions to conserve habitat or develop compatible management practices are needed. Examples abound of developments that could drastically affect or have already affected important sites used by shorebirds for breeding, migration, and wintering areas. In Canada, major development proposals have been made on the east coast (Bay of Fundy— tidal power), on northern coastlines (James Bay— Grand Canal scheme) and in the west (Fraser River delta— land development). In the United States, habitat destruction is a major concern at important shorebird areas. For example, pollution and over-harvesting of horseshoe crabs threaten key sites in Delaware Bay on the east coast. Changes in water table levels have already drastically affected major wetlands in the interior of the North American continent.

In South America, oil development (and attendant pollution) is found along coastal areas in southern Argentina and Chile. Pesticides affect wetlands in Suriname and Argentina, clearing of mangroves has degraded huge tracts of coastal habitats in Ecuador, and interior wetlands, such as the famed Pantanal in Brazil–Paraguay–Bolivia, could be adversely affected by the proposed Hidrovia River development megaproject.

Photo G.W. Beyersbergen

This cow is wandering in a sensitive shorebird nesting area, illustrating the need for informed land use practices in areas that are important for shorebirds.

Life-history strategy

Shorebirds demonstrate a life-history strategy based on a relatively low reproductive potential and long adult life span.

Shorebirds generally lay a maximum clutch of four eggs, and most species are restricted to a single clutch each year. Some species have a delayed age of first breeding. The many species that breed in the Arctic face uncertain and difficult weather conditions, which may prevent breeding in some years.

In addition, predator cycles may also compromise breeding in some years throughout the North American breeding range. These characteristics mean that shorebird populations are particularly vulnerable to increased adult mortality and have a limited capacity to recover quickly from declines.

Adaptability to environmental changes

While the life-history characteristics of shorebirds attest to an impressive degree of adaptation to a highly migratory lifestyle, they also draw attention to their vulnerability to environmental change.

The sensitivity of shorebird populations to rates of adult mortality needs to be addressed in conservation efforts directed at preserving migration and wintering areas, since these are thought to be where most adult mortality occurs. Breeding ground mortality of adults is also important for temperate breeding species. A major gap in our knowledge is just where and how the annual "mortality bottlenecks" occur.

The ability to complete long flights successfully depends on the capacity of shorebirds to accumulate large fat reserves to be used as fuel during the flight. Migration stopover sites, or staging areas, provide essential refueling without which the birds could not complete their journey. Degradation of habitat, leading to deterioration in amount and quality of food resources at these sites, puts shorebirds at a disadvantage (Alexander and Gratto-Trevor 1997). Extensive physiological changes, involving increases in the size of muscles and organs involved in flying, allow these birds to complete their lengthy migrations. Shorebird migration is often timed to coincide with seasonal abundance of food at particular sites, indicating that little leeway is available in the timing of migration. Shorebirds may also be vulnerable to the effects of environmental contaminants. Mortality due to exposure of shorebirds to agrichemicals (Hicklin and Spaans 1993) and toxic levels of trace elements (Ohlendorf et.al. 1986) has been documented but the effects of these exposures at a population level remains to be assessed.

Several other aspects of shorebird biology indicate that the birds are at risk from rapid or irreversible environmental change. Species breeding on Arctic tundra and wintering on sea coasts, which are habitats that are relatively parasite-free, may have traded in a reduced immunological competence in favour of the metabolic adaptations enabling them to adopt the high-energy-demanding lifestyle involved in migrating long distances. In addition, many shorebird species have a considerably lower genetic diversity than other avian species, which may also limit their ability to respond to environmental change.

Photo G.W. Beyersbergen

American Avocets on migration. Avocets may be attracted to habitats in winter that expose some to toxic chemicals including selenium found in irrigation canals and cyanide found in gold-mining tailings ponds.

Institutional challenges

To preserve such a diverse and wide-ranging group of species requires cooperation among many partners throughout Canada and internationally.

In the past, there has been a limited framework, organization, and process for cooperative efforts across Canada; a lack of coordinated efforts among countries; and a lack of targeted funding for shorebird conservation.

Within Canada, shorebird conservation is the responsibility of the Canadian Wildlife Service under the Migratory Birds Convention Act. However, many other conservation programs, run by both governments and non-government organizations, affect the birds and their habitats. For example, provincial wildlife, habitat, agriculture, and natural resource programs affect land use and management at regional and local levels. Aboriginal co-management boards play a key role in wildlife and habitat conservation in the North. Many significant initiatives are spearheaded by non-government organizations at both a national and regional scope. Local industry, land owners, and residents also make key decisions influencing conservation on the ground and must be engaged in the process.

Because of the extensive migratory range of many shorebird species, there is a strong need to work with other countries in North, Central, and South America to ensure there is long-term conservation of shorebirds. Indeed, it was the recognition of this interdependence that spurred the creation of the Western Hemisphere Shorebird Reserve Network (Appendix 3). The United States, like Canada, has developed a national plan for the conservation of shorebirds which presents an important opportunity for collaboration in surveys, research, and, in some cases, habitat protection and landscape conservation initiatives for shared species and populations (Brown et al. 2001).

Collaboration with Mexico and countries in Central and South America is more challenging. The distances involved can make establishing close working relationships difficult, as can the lack of familiarity with government and non-government programs. In addition, wildlife and habitat conservation initiatives in developing countries must be considered in the context of broader socio-economic development planning, and scientific capacity and infrastructure may be limited. However, the success of the Western Hemisphere Shorebird Reserve Network, over the past 15 years in Central and South America, shows that conservation action through cooperation is possible throughout the full range of Western Hemisphere shorebird populations.

Another key challenge arises from the need to find innovative sources of funding for shorebird conservation. Recently in North America, a developing emphasis on integrated conservation that addresses the needs of all birds is being promoted through NABCI. The involvement of a broad partnership in this process will ensure a diverse base on which to fund priority bird conservation projects. The development of this national shorebird plan will position shorebird conservation to take advantage of this potential, by raising the profile of shorebirds and their needs and placing them in the context of other national and international conservation initiatives. This will enable partner organizations and funding sources to assess and compare priorities, identify opportunities, track progress, and evaluate the results of their efforts.

The opportunities

The North American Bird Conservation Initiative: integrated bird conservation planning

By aiming to maintain and enhance sustainable populations of Canada's shorebirds throughout their range, the Canadian Shorebird Conservation Plan will integrate its actions with existing conservation initiatives, as well as fostering new ones that address shorebird needs.

The Canadian Shorebird Conservation Plan will play an important role within the North American Bird Conservation Initiative (NABCI), an integrated framework for bird conservation planning. This initiative, under development by government and non-government partners from Canada, the United States, and Mexico, will provide land managers and other decision-makers with a consistent framework for conservation actions and resource decisions for bird conservation throughout North America. Shorebird conservation priorities will be integrated with those for waterfowl, landbirds, and waterbirds. It is anticipated that NABCI will significantly increase profile and support for these initiatives.

A landscape approach

Throughout Canada and the United States, it has been recognized that an integrated landscape approach to wildlife conservation is needed. Rather than focusing efforts and resources on a few selected target species, managers need to take into account the needs of a broader suite of species normally found in an area.

This landscape approach is less costly to maintain habitat to support healthy wildlife populations than engaging in costly restoration and species recovery programs.

A good example of this new approach is found in the 1998 update of the North American Waterfowl Management Plan. It encourages partners to integrate the needs of other species, particularly migratory birds and species at risk, into waterfowl planning and implementation projects.

The Canadian Shorebird Conservation Plan will identify national priority shorebird conservation needs and strategies for integration with actions that benefit other wildlife and land use activities. This, coupled with regional planning initiatives, will ensure that conservation actions are undertaken in an efficient and effective manner.

Western Hemisphere Shorebird Reserve Network: an international framework

For highly migratory species such as shorebirds, we cannot sustain populations in Canada if effective conservation is not occurring in other parts of their range.

This recognition led to the establishment in 1985 of the Western Hemisphere Shorebird Reserve Network (WHSRN) (Appendix 3). Over 15 years, WHSRN has identified and formally recognized a network of key areas on which shorebirds depend. It has also become a network of the people, policies, and programs involved in shorebird conservation. The Canadian Shorebird Conservation Plan will take advantage of the framework provided by WHSRN for collaboration and communication among shorebird conservationists in Canada and throughout the Western Hemisphere.

In Canada, WHSRN is administered by the national working group that manages the Canadian Shorebird Conservation Plan ensuring that national and international aspects of shorebird conservation are carried out in a coordinated fashion.

Many shorebird species, like this mixed flock of Red Knots, American Golden Plovers and Black-bellied Plovers, benefit from the awareness raised through the designation of WHSRN sites.

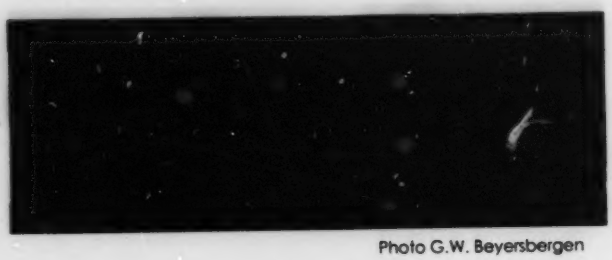


Photo G.W. Beyersbergen

Community benefits

Awareness and action at the community level are needed to complement broad-scale plans and frameworks. Local communities can influence and benefit from the mix of conservation and economic activities that occur in their area.

Ecotourism, a growing sector of the tourism industry, represents one opportunity for local communities to benefit economically from their support of wildlife. Shorebirds often occur in spectacular concentrations and provide excellent wildlife viewing opportunities. The Canadian shorebird plan will foster the efforts of local communities to enhance international linkages. For example, the "Linking Communities" initiative under WHSRN fosters collaboration and exchange of information among local groups at sites across the network.

Vision

Healthy populations of shorebirds are distributed across their range and diversity of habitats in Canada and throughout their global range.

Photo G.W. Beyersbergen

Mission

To build the scientific basis for shorebird conservation, identify and protect crucial habitat, restore species that are declining, and establish links with other countries that share Canada's shorebirds.

Goals, strategies, and results

Goal 1: *Sustain the distribution, diversity, and abundance of shorebird populations within Canada and restore populations of declining, threatened, and endangered species.*

Strategies:

- obtain information on the distribution, status, and trends of shorebird populations
- increase understanding of the factors affecting shorebird population dynamics, ecology, and migration systems

Results:

- Canada's shorebirds are monitored with sufficient intensity to determine the significance of population trends, especially for priority species
- priority habitats are identified by an integrated continental approach that assesses habitats for all birds
- key factors limiting shorebird populations are better understood
- threatened and endangered species are identified and recovered
- information is obtained to evaluate success of plan implementation

Although there is a baseline of information on shorebird populations from a variety of research and survey programs, much remains to be known. An important step in efforts to sustain or increase shorebird populations is the ability to monitor them and detect significant changes. A national survey and monitoring plan, integrated with other bird monitoring plans such as the U.S. shorebird plan, is an important goal. Monitoring data are therefore an effective management tool that can be used to ensure shorebird populations are sustained or enhanced and can thus be used to evaluate the success of conservation actions.

The Canadian shorebird plan, unlike the plan developed in the U.S., has not set population targets for shorebird species but will address conservation action on the basis of population trend information. However, such targets for shorebird populations or habitats may be set in future if deemed feasible. For Species at Risk, targets may be set in recovery strategies and action plans.

Research into factors affecting shorebird populations is also crucial: what conditions influence annual recruitment and mortality rates or determine habitat preferences and migration pathways? Without an understanding of these factors, management efforts and recovery plans will be ineffective.

A system to identify priority species is important to focus research, monitoring, and management efforts. Such a system has been developed for shorebirds in the United States and Canada (Appendix 4). It provides a clearly organized method for categorizing the various risk factors that affect the conservation status of each species on a continental basis, in a format that can be easily updated as additional information becomes available. It can be used to develop priority lists at regional levels. A similar prioritization scheme, modified to incorporate all bird species will be used to identify priority habitats within NABCI Bird Conservation Regions.

Goal 2: Secure and enhance sufficient high quality habitat to support healthy populations of shorebirds throughout their ranges in Canada.

Strategies:

- identify and secure key shorebird breeding, migration, and wintering habitat in Canada
- increase understanding of shorebird habitat requirements, management actions and opportunities that can mitigate limiting factors

Results:

- key factors affecting shorebird habitat requirements are better understood
- shorebird populations remain stable or increase as a result of habitat quality or quantity issues
- best practices are identified and implemented to integrate shorebird habitat needs with other landscape uses
- important shorebird habitats are secured through legislation, and/or habitat conservation programs (e.g., conservation easements, stewardship agreements, etc.)

Key staging sites for shorebirds during migration have been identified under the WHSRN program (Appendix 3). Of the 54 potential sites identified to date in Canada, 5 have been officially designated as part of the international network. Management and stewardship efforts are underway at these as well as at several other sites. An important question that remains is how to identify and protect key breeding sites, where the birds are typically much more dispersed.

It is crucial to understand shorebird ecology and habitat needs in landscapes affected by farming, ranching, recreation, urbanization, and other human activities. Natural environmental changes, such as those caused by drought, may create profound changes in the distribution and quality of habitat. What factors affect shorebird habitat selection, prey availability, foraging type and rate, and fat deposition for migration? How can important habitats be managed in the face of challenges such as increasing recreational activity and bait worm harvest in the Bay of Fundy, the threat of botulism outbreaks in prairie sloughs, or the loss of wetlands to development in the Fraser Delta? Research and management efforts are required to help answer these questions.

Studies of shorebird habitat requirements will help managers integrate the needs of shorebirds with those of other species. Through NABCI, there is an excellent opportunity to cooperate through broad-based partnerships so that all species benefit more fully from habitat conservation activities.

American Avocet

Photo G.W. Beyersbergen

Goal 3: Ensure that information on shorebird conservation needs and practices is widely available to decision makers, land managers, and the public.

Strategies:

- ensure that information on shorebird conservation is available in a form that is useful for regional and local planning purposes
- identify and promote best land use practices for shorebirds
- provide information and outreach to influence decision makers and the public on conservation and land use policies and practices

Results:

- land managers and regional planners incorporate shorebird conservation needs into their plans and actions
- the profile of shorebirds and their conservation needs is elevated with decision makers and the public
- best practices and policies for the conservation of shorebirds and other wildlife are accepted and widely implemented

Recent development and implementation of the North American Waterfowl Management Plan program across many Canadian and U.S. landscapes is a demonstration of an excellent approach for delivery of wildlife conservation on the ground using a cooperative partnership approach. Such cooperation has paved the way for efforts like NABCI to raise the profile and support accorded to bird conservation throughout North America.

Resource managers and land use planners are increasingly receptive to taking the conservation needs of non-game wildlife into account. However, they often lack the tools to do so — research results, technical manuals, case studies, and education/outreach materials. The information must be readily available in a form for easy integration with other planning and resource management information. This often requires an electronic database or GIS-compatible format. Encouraging the development and integration of such material, by working with partners, must be a key element of the national approach.

Education and outreach are recognized as crucial factors contributing to the success of conservation initiatives. The support and participation of local communities is often crucial to the success of conservation efforts, for example, at WHSRN sites. There are positive effects on the local economy, through ecotourism, the building of new infrastructure, or sustainable use initiatives. Information and educational materials, workshops, presentations, and local projects can help gain the understanding and support of communities.

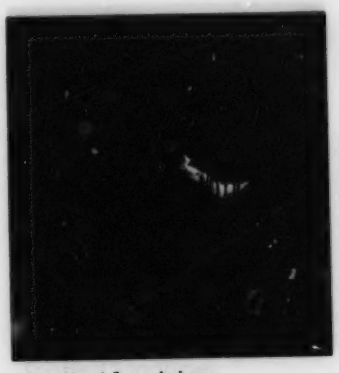


Photo G.W. Beyersbergen

Spotted Sandpiper

Goal 4: *Ensure that coordinated shorebird conservation efforts are in place, on the ground, throughout the range of Canadian shorebird species.*

Strategies:

- facilitate the development of regional shorebird plans in Canada
- facilitate coordinated research and monitoring initiatives directed at priority shorebird conservation requirements
- link WHSRN sites in Canada with sites in the United States, Mexico, and Latin America
- exchange information and expertise and help develop scientific and conservation capacity in Mexico and Latin America

Results:

- shorebird conservation plans are in place and implemented at the regional level across Canada and integrated at the national and international levels
- WHSRN is an active, full spectrum conservation network of people, programs, and policies for shorebird conservation throughout the Western Hemisphere
- the human and institutional capacity and infrastructure for shorebird conservation is increased
- shorebird populations and their habitats are healthy throughout their ranges

Shorebird conservation actions in Canada must take place mainly at local and regional levels where land use decisions are put into effect. Thus, a major goal of the national plan is to support the development and implementation of regional plans. The geographic boundaries for these plans take into account jurisdictional or administrative boundaries that will play an important role in implementation (e.g. provincial, Joint Venture, and NABCI Bird Conservation Region boundaries). A CSCP national working group will facilitate consistency and coordination of regional plans across the country, as well as integration with the U.S. national plan.

At the international level, WHSRN serves as a framework for linking shorebird conservation efforts throughout the Western Hemisphere. Promoting communication among sites, based on the migration pathways of the birds, encourages contacts between local groups and the exchange of information and resources. It also provides a forum for collaboration in research and monitoring that brings to the program a technical expertise at a species and landscape level. Communication between linked sites also leads to a greater understanding of the conservation needs and challenges in different countries.

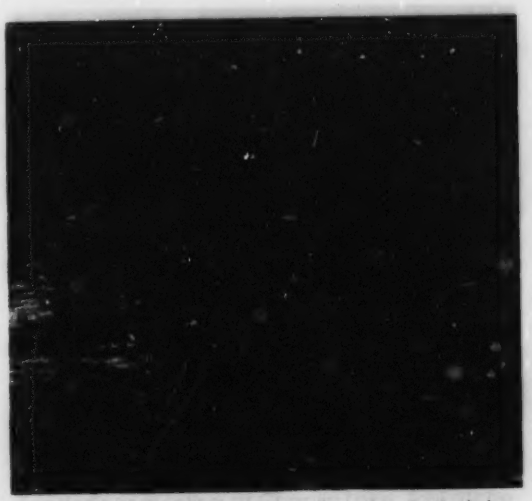


Photo G.W. Beyersbergen

Sanderlings roosting at Chaplin Lake, Saskatchewan, part of a complex of lakes that have been designated as WHSRN site of hemispheric importance (see Appendix 4).

Goal 5: *Ensure that shorebird conservation efforts are guided by common principles throughout the Western Hemisphere.*

Strategies:

- influence environmental policies and programs that affect shorebird conservation
- support the development of strong organizations within Canada and internationally which support shorebird conservation issues
- Support policy development beneficial to shorebirds within NABCI and WHSRN

Results:

- principles that support shorebird conservation are incorporated into agreements and programs
- government and non-government groups play an active role in promoting and implementing shorebird conservation activities in Canada and other countries

Within NABCI, it is recognized that local, national, and international policies and programs can have a crucial effect on bird conservation through their effects on landscapes and land use. It is thus important to identify and promote policies and practices that have a positive influence on shorebird conservation and make efforts to influence the development of those that do not. This effort is strengthened by coordination and consistency among regions and countries working towards common goals.

Much conservation work is carried out by non-government organizations, in Canada and the United States as well as in Central and South American countries. These groups have a vital role to play in undertaking local conservation activities, creating public awareness, and rallying public support for conservation issues. They also have a unique role in influencing governments in the development of sound environmental laws, policies, and programs.

Photo G.W. Beyersbergen

The Hudsonian Godwit migrates from the Canadian north to southern South America and thus requires multi-national cooperation for effective conservation action.

Plan structure

Within NABCI, bird conservation in Canada will proceed using a two-part management approach.

Each of the four major bird initiatives in Canada will have national working groups to promote the development of a biological foundation for the implementation of conservation action. Based on strong partnerships, national working groups also strive to facilitate and evaluate the implementation of conservation priorities. The other component is the NABCI-Canada Council that is responsible for overseeing integration among Canada's four bird conservation initiatives and develops the resources, policies and strategic direction needed for effective bird conservation action.

Canadian shorebird national working group

The CSCP national working group will support and facilitate coordinated planning and implementation of shorebird conservation at international, national, regional (BCR) and local levels. Actions will be based on a foundation of science that originates at regional, national and international levels.

As conservation actions must reflect needs across birds' ranges, the national working group will oversee the development of WHSRN in Canada and will eventually form a Canadian component of a multi-national plan that is hemispheric in scope.

The roles of the CSCP national working group include:

- setting national biological priorities within the CSCP;
- identifying broad issues affecting shorebirds or their habitats and identifying broad-scale geographic or biophysical areas of key importance;
- representing Canada on the international WHSRN Advisory Council including participation in the setting of international biological and management priorities;
- encouraging and supporting new Canadian WHSRN site nominations in accordance with established criteria and providing recommendations for action to the WHSRN Advisory Council;
- facilitating development of shorebird plan activities at the BCR level by providing advice to regional/BCR planning teams and JVs on conservation planning and implementation as required;
- identifying and addressing policy, science and other needs, arising from regional plans or from partners, that are required to achieve CSCP goals;
- evaluating progress towards achieving goals and objectives and recommend ways to adjust actions if necessary;
- assisting in the integration of shorebird conservation priorities and goals with other conservation initiatives or programs and fostering partnerships; and,
- report on progress, communicate needs, and actively participate in the NABCI-Canada

The CSCP Science Support Team

The Science Support Team is a pool of scientific expertise that will assist in the movement towards reaching plan goals by providing a base of sound science. Members of this team are identified through their expertise and bring to the team their links to regional and international scientific fora. They may be drawn from all partner organizations including government and non-governmental agencies.

Functioning of the Science Support Team will occur at national and regional levels and will include:

- reviewing the status of knowledge of specific species and their habitats;
- recommending or reviewing monitoring protocols and facilitating their implementation as appropriate;
- providing technical advice to the shorebird national working group and the NABCI-Canada Council and bird conservation regions or joint ventures; and,
- developing links between national working groups and international scientific fora through overlapping participation.

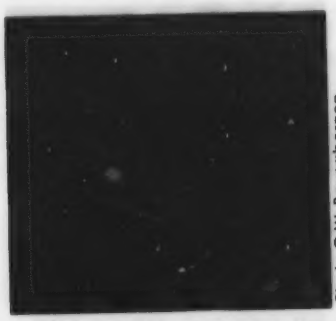


Photo G.W. Beyersbergen

All shorebird species, including the abundant Killdeer and the endangered Piping Plover, will benefit from the implementation of the Canadian Shorebird Conservation Plan.

The NABCI-Canada Council

The role of the Council is to facilitate an all-bird approach to conservation on a continental scale by providing strategic direction to national working groups, BCRs and JVs and by representing Canada tri-nationally. It's responsibilities include:

- representing Canadian bird conservation interests at international fora;
- providing a table at which Canada's four bird conservation initiatives meet to integrate their efforts;
- providing the political and financial environments needed to meet the goals of NABCI and the bird initiatives in Canada; and,
- relaying Council's directions and decisions back to their constituency.

The steps ahead

The next steps for the national working group and its partners to move the Canadian Shorebird Conservation Plan forward include:

- consultation to broaden support of government agencies and the commitment and involvement of other partners;
- completion of regional shorebird conservation plans in Canada;
- the development of Canadian resourcing and plan implementation strategies;
- the expansion of shorebird conservation action throughout the Western Hemisphere through WHSRN and NABCI.

An evaluation of the plan should take place within three years to determine progress and new courses of action that may be needed.

Acknowledgments

This plan has benefited from the work and input of many people including members of the CSCP Steering Committee: **Stephen Brown**, Coordinator, U.S. Shorebird Conservation Plan; **Bob Carles**, General Manager, Saskatchewan Wetland Conservation Corporation; **Ken Cox**, Executive Secretary, North American Wetlands Conservation Council; **Ian Davidson**, Director, BirdLife International - Americas; **Loney Dickson**, Chief, Migratory Birds Conservation Division, Canadian Wildlife Service Prairie and Northern Region; **George Finney**, Chair, Eastern Habitat Joint Venture, North American Waterfowl Management Plan (NAWMP); **Rod Fowler**, Executive Vice-President, Ducks Unlimited Canada; **Colleen Hyslop**, Conservation Biologist, Canadian Wildlife Service Headquarters; **Art Martell**, Co-chair, Pacific Coast Joint Venture - NAWMP; **Guy Morrison**, Coordinator, CSCP Science Support Team, Canadian Wildlife Service; **David Neave**, Wildlife Habitat Canada; **Caroline Schultz**, Canadian Nature Federation. CSCP Technical Advisory Committee members and others who attended the workshops in Saskatoon, Saskatchewan, in September 1998 and Oak Hammock, Manitoba, in October 1998, including colleagues from the United States. Editorial comments from **Bob McLean**, **Judith Kennedy**, **Steve Wendt**, **Stephen Davis,** and **Pat Logan** greatly improved the text of this document.

References

Alexander, S.A., C.L. Gratto-Trevor. 1997. Shorebird migration and staging at a large prairie lake and wetland complex: the Quill Lakes, Saskatchewan. Canadian Wildlife Service. Occasional Paper No. 97. Environment Canada, Ottawa, Canada. 47 p.

Brown, S., C. Hickey, B. Harrington and R. Gill eds. 2001. United States Shorebird Conservation Plan, 2nd ed. Manomet Center for Conservation Sciences. Manomet, Massachusetts. 60 p.

Hicklin, P.W., A.L. Spaans. 1993. The birds of the SML rice fields in Suriname: species composition, numbers and toxichemical threats. Technical Report 174. 166 p.

Morrison, R.I.G., A. Bourget, R. Butler, H.L. Dickson, C. Gratto-Trevor, P. Hicklin, C. Hyslop, and R.K. Ross. 1994a. A preliminary assessment of the status of shorebird populations in Canada. Canadian Wildlife Service. Progress Note 208, Environment Canada, Ottawa, Canada. 19 p.

Morrison, R.I.G., C. Downes, and B. Collins. 1994b. Population trends of shorebirds on fall migration in eastern Canada 1974–91. Wilson Bull. 106(3): 431-447.

Morrison, R.I.G., R.W. Butler, G.W. Beyersbergen, H.L. Dickson, A. Bourget, P.W. Hicklin, J.P. Goossen, R.K. Ross, and C.L. Gratto-Trevor. 1995. Potential Western Hemisphere Shorebird Reserve Network sites for shorebirds in Canada. Second Edition. Canadian Wildlife Service. Technical Report No. 227. Environment Canada, Ottawa, Canada. 104 p.

Morrison, R. I. G., Y. Aubry, R. W. Butler, G. W. Beyersbergen, G.M. Donaldson, C. L. Gratto-Trevor, P.W. Hicklin, V.H. Johnston, , and R. K. Ross, 2001a. Declines in North American shorebird populations. Wader Study Group Bulletin 94:34-38.

Morrison, R.I.G., R.E. Gill, B.A. Harrington, S. Skagen, G.W. Page, C.L. Gratto-Trevor, and S. M. Haig. 2001b. Estimates of shorebird populations in North America. Canadian Wildlife Service. Occasional Paper No. 104. Environment Canada, Ottawa, Canada. 64 p.

Ohlendorf, H.M., D.J. Hoffman, M.K. Saiki, T.W. Aldrich. 1986. Embryonic mortality and abnormalities of aquatic birds: apparent impacts of selenium from irrigation drainwater. Sci. Total Environ. 52:49-63.

Appendix 1

Estimated population sizes and abundance status for 47 species of shorebirds breeding or occurring regularly in Canada (after Morrison, et al. 2001b).

Code	Species	Scientific name	Estimated population[1]			Current maximum count totals observed in each flyway[2]				
			N. America	Canada	% NA range in Canada[3]	Pacific flyway	Central flyway	Eastern flyway	Breeding-status (Canada)[4]	Abundance status (Canada)[5]
BBPL	Black-bellied Plover	*Pluvialis squatarola*	200 000	200 000		52 100	33 100	26 900	B	Com
AGPL	American Golden-Plover	*Pluvialis dominica*	150 000+	150 000+	78.2	77 800	31 200	15 000	B	Com
CRPL	Common Ringed Plover	*Charadrius hiaticula*	< 10 000	< 10 000	100	-	-	10 000	B	Reg
SEPL	Semipalmated Plover	*Charadrius semipalmatus*	150 000	150 000	70.5	13 000	13 100	108 900	B	Com
PIPL	Piping Plover	*Charadrius melodus*	5 813	2 110		-	3 284	2 612	B	End
KILL	Killdeer	*Charadrius vociferus*	1 000 000	366 000	36.6	20 000+	39 400	19 400	B	Com
MOUP	Mountain Plover	*Charadrius montanus*	9 000	10		6 700	2 500	-	B	End
AMOY	American Oystercatcher	*Haematopus palliatus*	3 630	4		-	-	4	B	Sca
BLOY	Black Oystercatcher	*Haematopus bachmani*	8 900	8 000		11 000	-	-	B	Reg
BNST	Black-necked Stilt	*Himantopus mexicanus*	150 000+	400		16 000	120 000	5 400	B	Sca
AMAV	American Avocet	*Recurvirostra americana*	450 000	63 000	13.9	56 300	325 300	4 900	B	Reg
GRYE	Greater Yellowlegs	*Tringa melanoleuca*	100 000	100 000	87.7	2 500	20 800	23 100	B	Com
LEYE	Lesser Yellowlegs	*Tringa flavipes*	500 000	500 000	81.4	3 000	135 700	80 600	B	Com
SOSA	Solitary Sandpiper	*Tringa solitaria*	25 000	25 000	93.9	200	5 600	1 500	B	Reg
WILL	Willet	*Catoptrophorus semipalmatus*	250 000	25 000		106 300	52 300	15 600	B	Com
WATA	Wandering Tattler	*Heteroscelus incanus*	10 000	5 000	37.0	5 000	-	-	B	Com
SPSA	Spotted Sandpiper	*Actitis macularia*	150 000	113 000	50.9	1 500	6 000	5 000	B	Com
UPSA	Upland Sandpiper	*Bartramia longicauda*	350 000	10 000?		12	4 600	500	B	Unc
ESCU	Eskimo Curlew	*Numenius borealis*	< 50	< 50		-	-	-	B	End
WHIM	Whimbrel	*Numenius phaeopus*	57 000	57 000	46.5	25 000	4 400	3 100	B	Com
LBCU	Long-billed Curlew	*Numenius americanus*	20 000	(1000s?)		11 200	8 100	160	B	Spe
HUGO	Hudsonian Godwit	*Limosa haemastica*	50 000	50 000	41.6	230	17 200	11 000	B	Reg

Code	Species	Scientific name	Estimated population[1]		% NA range in Canada[3]	Current maximum count totals observed in each flyway[2]			Breeding-status (Canada)[4]	Abundance status (Canada)[5]
			N. America	Canada		Pacific flyway	Central flyway	Eastern flyway		
MAGO	Marbled Godwit	*Limosa fedoa*	171 500	103 000	59.6	152 800	58 700	680	B	Reg
RUTU	Ruddy Turnstone	*Arenaria interpres*	235 000	235 000	73.1	200	21 000	54 000	B	Com
BLTU	Black Turnstone	*Arenaria melanocephala*	80 000	80 000		80 000	-	-		Com
SURF	Surfbird	*Aphriza virgata*	70 000	70 000	27.5	70 000	-	-	B	Reg
REKN	Red Knot	*Calidris canutus*	400 000	256 000	91.5	156 000	20 000	145 000	B	Com
SAND	Sanderling	*Calidris alba*	300 000	300 000	97.8	50 000	130 400	99 000	B	Com
SESA	Semipalmated Sandpiper	*Calidris pusilla*	3 500 000	3 500 000	84.9	700	260 700	994 600	B	Abu
WESA	Western Sandpiper	*Calidris mauri*	3 500 000	3 500 000		1 000 000	138 000	40 700		Abu
LESA	Least Sandpiper	*Calidris minutilla*	600 000	600 000	70.7	150 000	322 700	101 900	B	Com
WRSA	White-rumped Sandpiper	*Calidris fuscicollis*	400 000	400 000	95.7	-	343 300	23 300	B	Com
BASA	Baird's Sandpiper	*Calidris bairdii*	300 000	300 000	79.8	1 500	142 900	1 090	B	Com
PESA	Pectoral Sandpiper	*Calidris melanotos*	400 000	400 000	77.1	450	83 800	62 200	B	Com
SHAS	Sharp-tailed Sandpiper	*Calidris acuminata*	3 000	1 000		1 000	-	-		Unc
PUSA	Purple Sandpiper	*Calidris maritima*	15 000	15 000	100	-	-	10 000	B	Com
ROSA	Rock Sandpiper	*Calidris ptilocnemis*	150 000	10 000?		10 000	-	-		Com
DUNL	Dunlin	*Calidris alpina*	850 000	775 000	65.8	460 000	91 900	132 000	B	Com
STSA	Stilt Sandpiper	*Calidris himantopus*	200 000	200 000	80.5	-	152 000	30 000	B	Com
BBSA	Buff-breasted Sandpiper	*Tryngites subruficollis*	15 000	15 000	86.7	30	6 100	590	B	Reg
SBDO	Short-billed Dowitcher	*Limnodromus griseus*	320 000	320 000	92.3	150 000	60 000	112 300	B	Com
LBDO	Long-billed Dowitcher	*Limnodromus scolopaceus*	500 000	400 000?	43.4	200 000	290 800	5 700	B	Reg
COSN	Common Snipe	*Gallinago gallinago*	2 000 000	2 000 000		?	68 000	47 000	B	Com
AMWO	American Woodcock	*Scolopax minor*	5 000 000	1 000 000		20	5 000	56 000	B	Com
WIPH	Wilson's Phalarope	*Phalaropus tricolor*	1 500 000	680 000	45.3	82 500	827 100	800	B	Com
RNPH	Red-necked Phalarope	*Phalaropus lobatus*	2 500 000	2 500 000	74.3	83 200	348 200	2 000 000	B	Com
REPH	Red Phalarope	*Phalaropus fulicaria*	1 000 000	920 000	91.8	-	-	100 400	B	Com

1 See Morrison et al. 2001 for derivation of population estimate. N. America = Canada, U.S.A. (including Alaska), and Mexico; Canada = Canada only.

2 Numbers represent highest sum of maximum counts recorded in the flyway during either northward or southward migration and are not estimated proportions of total population using the flyway; for areas covered by each flyway

3 E. Dunn, pers. comm.

4 B = breeding confirmed in Canada

5 Abu = abundant, Com = common, Reg = regular, Unc = uncommon; Sca = scarce, Spe = special concern, Thr = threatened, End = endangered (see Morrison et al. 1994a for more details).

Appendix 2

Summary of recently updated and other selected trend analyses of shorebird populations in North America. See next page for legend and overall summary.

	Maritime Provinces	Quebec	Ontario	Breeding Bird	Arctic Rasmussen	Arctic Churchill	Pacific coast	East coast	Overall
	1974-1998 Annual % change	1976-1998 Pearson coefficient	1976-1997 Annual % change	1966-1999 Annual % change	1970s - 1990s	1983-1993	1991-1998	1974-1982 Annual % change	
Black-bellied Plover	+0.366	-0.228	+4.33		⇓⇓ - *			**-5.4 ***	⇓⇓
American Golden-Plover	-50.4	-0.143			⇓⇓ - *				⇓⇓
Semipalmated Plover	-1.55	**-0.504 ***	-1.97					-9.5	⇓⇓
Killdeer		**-0.777 ***	-2.23	**-0.3 ***					⇓⇓
Mountain Plover				-0.9					(-)
Black-necked Stilt				+0.6					(+)
American Avocet				-0.2					(-)
Greater Yellowlegs		+0.017	-7.65	+12.8				-3.1	⇔
Lesser Yellowlegs		-0.091	*-7.13*	**-8.2 ***				+3.5	⇓⇓
Solitary Sandpiper		-0.177	-1.61	*-10.2*					⇓
Willet	-0.099			-0.6				+0.2	⇔
Spotted Sandpiper	-3.06	**-0.480 ***	-2.25	-0.5					⇓⇓
Upland Sandpiper		-0.090		**+1.0 ** **					⇑
Whimbrel	+4.37	+0.311						**-8.3 ** **	⇔
Long-billed Curlew				*-1.5*					(-)
Hudsonian Godwit	-4.83	-0.087							⇓
Marbled Godwit				-0.5					⇓
Ruddy Turnstone	**-3.28 ***	**-0.648 ***						-8.5	⇓⇓
Red Knot	**-17.6 ***	**-0.543 ***						-11.7	⇓⇓
Sanderling	**-7.78 (*)**	**-0.399 (*)**	-1.25					**-13.7 ** **	⇓⇓
Semipalmated Sandpiper	**-7.66 ***	**-0.667 ***	**-4.97 ***		-	⇓	⇓⇓	-6.7	⇓⇓
Western Sandpiper							⇓⇓		⇓⇓
Least Sandpiper	**-15.8 ** **	-0.007	*-4.19*					+2.9	⇓⇓
White-rumped Sandpiper	-10.9	+0.031			⇓ -				⇔
Baird's Sandpiper					-				⇓
Pectoral Sandpiper	+2.54	+0.043	*-8.34*		-				⇔
Purple Sandpiper		**-0.531 ***							⇓⇓
Dunlin	**-7.17 (*)**	-0.335	+1.42		-				⇓⇓
Buff-breasted Sandpiper					-				⇓
Short-billed Dowitcher	**-9.26 ***	-0.065	-6.35					**-5.5 ***	⇓⇓
Common Snipe		**-0.602 ***	**-15.3 (*)**	0.00					⇓⇓
American Woodcock				-2.3					⇓
Wilson's Phalarope		-0.040		**-2.2 ***					⇓⇓
Red-necked Phalarope		**-0.566 ***				⇓			⇓⇓
Red Phalarope		-0.337			⇓⇓ - *				⇓⇓

	Maritime Provinces	Quebec	Ontario	Breeding Bird	Arctic Rasmussen	Arctic Churchill	Pacific coast	East coast	Overall
Total species	16	25	14	15	9			12	31 (35)
No. species negative	13	21	12	11	9			9	25 (28)
No. species positive	3	4	2	3	0			3	6 (7)
c^2 test, significance	p=0.01	p=0.0006	p=0.008	p=0.03	p=0.003			p=0.08	p=0.0006
No. sig, negative trends	7	10	1	3	3		2	4	19
No. sig, positive trends	0	0	0	1	0			0	1

Trends for species occurring predominantly in the USA derived from Breeding Bird Survey data only are shown in brackets; summary totals including these species are also shown in brackets. "No. species positive" includes both positive and mixed trend estimates.

From page 22:

Statistically significant trends or changes are indicated in **bold**, with:

**=p<0.01,
*=p<0.05,
(*)=p<0.10;
numbers in italics indicate p<=0.15.

In columns where no numerical estimate is shown:

"-" indicates a negative change,
⇓ indicates a large but not statistically significant (or not statistically tested) negative change, and
⇓⇓ indicates a statistically significant (p<0.05) negative change.

For the "Overall assessment" column:

⇓⇓ indicates predominantly negative trends or changes across analyses with at least one significantly negative trend or change,
⇓ indicates predominantly negative trends or changes or only estimate available is negative,
⇔ indicates analyses include both positive and negative trends,
⇑ indicates best estimate involves significant positive trend.

Photo G.W. Beyersbergen

Red Phalaropes

Appendix 3

The Western Hemisphere Shorebird Reserve Network in Canada

The Western Hemisphere Shorebird Reserve Network (WHSRN) was initiated in 1985 to address shorebird conservation issues arising from decades of research by the Canadian Wildlife Service, the Academy of Natural Sciences of Philadelphia, the Manomet Bird Observatory, and others. This research showed that many species of shorebirds were in decline, probably as a result of wetland habitat loss. WHSRN, a voluntary collaboration of private and government organizations, gives international recognition to critical shorebird habitats and promotes their cooperative management and protection. The network uses shorebirds, many of which fly from continent to continent during yearly migrations, as a symbol for uniting countries in a global effort to maintain the Earth's biodiversity.

To safeguard critical habitat for shorebirds, WHSRN works to identify critical wetland stopover sites and bring them into an international network. Membership in the network is completely voluntary and based upon biological criteria and nomination by land owners. Both public and private lands are included in the network. Habitat protection is fostered through voluntary commitments to long-term management to benefit shorebirds and a multitude of other wildlife species. Member sites are given technical assistance and training in the development of management plans and research programs. Environmental education and "twinning" of geographically distant reserves that host the same species are also promoted. Membership in WHSRN brings international recognition to critical wetland sites, enhancing their capacity for conservation.

Currently, there are 47 designated sites in seven countries in the Americas. Of the 54 potential WHSRN sites in Canada (Morrison et al. 1995) (see figure below), 5 sites are designated. Strong support for these sites by their nominators has helped to provide guidance on important issues such as bait worm harvest in rich tidal flats used extensively by feeding shorebirds in the Bay of Fundy. Support for ecotourism at Chaplin and Quill lakes has helped to increase awareness and has empowered adjacent communities to play a more active role in the site's management.

The Network works to achieve five main goals:

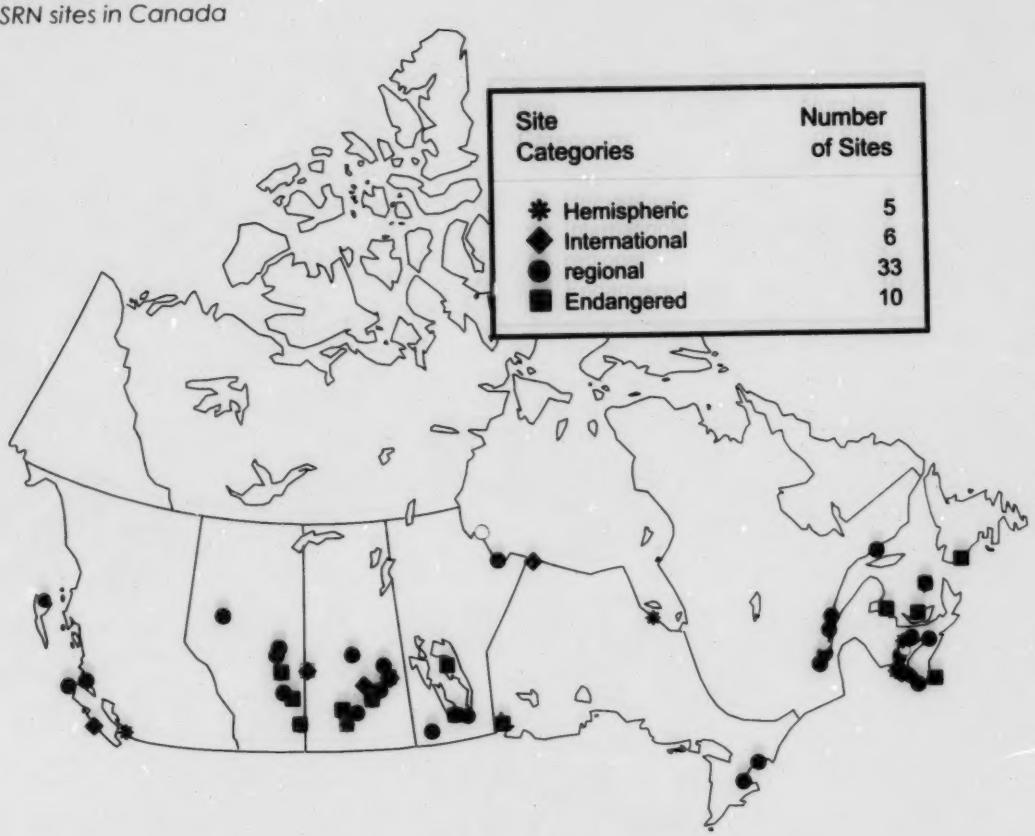
1. identify and protect sites critical to the Western Hemisphere's migratory shorebirds
2. promote and support the development of strong conservation organizations and their efforts to protect shorebirds and shorebird habitats
3. build strong public support for wetlands and shorebird conservation through education and public awareness (e.g., Save Our Migratory Birds program)
4. develop and support international, national, and local policies to help ensure the long-term protection and management of the hemisphere's migratory shorebirds and critical wetlands
5. compile, analyze, and disseminate information on shorebird distribution, migration, habitat, and biology in the Western Hemisphere (International Shorebird Survey).

The WHSRN Advisory Council includes diverse representation from scientific, government, environmental, and private organizations with the purpose of advising staff on the long-range strategies for the Network. The Council provides strategic guidance to WHSRN staff in working with relevant government agencies and land management authorities responsible for important shorebird habitats and ratifies nominated sites after they are reviewed and recommended by the Scientific Advisory Board. It also provides a focal point for disseminating information on shorebirds and their habitats. The Council provides a service; neither it nor the Network comprises a governing or regulatory body.

WHSRN categories are defined as follows :

- **hemispheric** sites host more than 500 000 shorebirds annually or 30% of the species flyway population based on peak species counts
- **international** sites host more than 100 000 shorebirds annually or 15% of the species flyway population based on peak species counts
- **regional** sites host more than 20 000 shorebirds annually or 5% of the species flyway population based on peak species counts
- **endangered** sites are essential to the survival of endangered species, therefore a minimum number of birds is not necessary

Potential and dedicated WHSRN sites in Canada



Appendix 4

Priority setting system for shorebirds in the United States and Canada ; see legend for interpretation.

Species in taxonomic order	PT	RA	TB	TN	BD	ND	Category	Rule
Black-bellied Plover	5	3	2	2	2	1	3	3a
American Golden-Plover	4	3	2	4	2	3	4	4a,b
Pacific Golden-Plover	3	4	2	2	5	4	3	3b
Snowy Plover	5	5	4	4	3	4	5	5a
Wilson's Plover	3	4	4	4	4	3	4	4b
Common Ringed Plover	3	5	3	4	5	3	2	2a
Semipalmated Plover	3	3	2	2	1	1	2	2a
Piping Plover	5	5	5	4	4	4	5	5a
Killdeer	5	3	3	3	1	2	3	3a
Mountain Plover	5	5	4	4	5	4	5	5a
American Oystercatcher	3	5	4	4	3	4	4	4b
Black Oystercatcher	3	5	4	3	3	4	4	4b
Black-necked Stilt	3	3	3	2	1	2	2	2a
American Avocet	3	2	3	4	2	3	3	3b
Greater Yellowlegs	3	4	2	2	2	1	3	3b
Lesser Yellowlegs	3	2	2	3	2	1	2	2a
Solitary Sandpiper	3	4	2	2	3	2	3	3b
Willet	3	3	3	3	3	3	3	3c
Wandering Tattler	3	5	2	2	3	2	3	3b
Spotted Sandpiper	3	4	2	2	1	1	3	3b
Upland Sandpiper	2	2	2	4	2	3	2	2b
Eskimo Curlew	5	5	3	4	5	5	5	5a
Whimbrel	5	4	2	2	3	2	4	4a
Bristle-thighed Curlew	3	5	2	4	5	3	4	4b
Long-billed Curlew	5	5	3	3	3	3	5	5a
Hudsonian Godwit	3	4	3	4	4	4	4	4b
Bar-tailed Godwit	3	4	2	4	4	3	4	4b
Marbled Godwit	4	3	4	4	3	3	4	4a,b
Ruddy Turnstone	4	3	2	4	2	2	4	4a,b
Black Turnstone	3	4	4	4	5	3	4	4b
Surfbird	4	4	2	4	4	3	4	4a,b
Red Knot	5	2	2	4	3	3	4	4a
Sanderling	5	2	2	4	2	1	4	4a
Semipalmated Sandpiper	5	1	2	3	3	3	3	3a
Western Sandpiper	3	1	2	4	4	2	3	3b
Least Sandpiper	5	2	2	2	2	2	3	3c
White-rumped Sandpiper	3	2	2	2	3	3	2	2a
Baird's Sandpiper	3	2	2	2	3	3	2	2a
Pectoral Sandpiper	3	2	2	2	2	3	2	2a
Purple Sandpiper	2	5	2	3	3	3	2	2b
Rock Sandpiper	3	3	3	4	5	4	3	3b
Dunlin	5	1	2	3	2	3	3	3a
Stilt Sandpiper	3	3	3	4	3	3	3	3b
Buff-breasted Sandpiper	4	4	3	4	3	4	4	4a,b
Short-billed Dowitcher	5	2	2	3	3	2	3	3a
Long-billed Dowitcher	2	2	2	3	4	3	2	2b
Common Snipe	5	1	2	2	1	2	3	3c
American Woodcock	5	1	4	3	2	3	4	4a
Wilson's Phalarope	4	1	3	4	2	5	4	4a
Red-necked Phalarope	4	1	2	3	1	3	3	3a
Red Phalarope	4	1	2	3	2	1	3	3a

Legend:

PT = Population Trend Estimate
5 = significant population decline ($p < 0.10$)
4 = apparent population decline
3 = apparently stable population or status unknown (if the population trend cannot be classified at all due to the lack of appropriate data, the PT score is represented as "U" for Unknown)
2 = apparent population increase
1 = significant population increase

RA = Relative Abundance Estimate
5 = ≤25 000
4 = 25 000 – 150 000
3 = 150 000 – 300 000
2 = 300 000 – 1 000 000
1 = >1 000 000

TB = Threats during Breeding Season
5 = known threats are actually occurring (i.e., significant loss of critical habitat) and can be documented
4 = significant potential threats exist (i.e., oil spills) but have not actually occurred
3 = no known threats, or information not available
2 = threats assumed to be low
1 = demonstrably secure

TN = Threats during Non-breeding Season
5 = known threats are actually occurring (i.e., significant loss of critical habitat) and can be documented. Concentration of birds in an area results in actual risk.
4 = significant potential threats exist (i.e., oil spills) but have not actually occurred. Concentration of birds in an area results in high potential risk.
3 = no known threats, or concentration not a risk, or information not available
2 = threats assumed to be low from all factors including concentration
1 = demonstrably secure

BD = Breeding Distribution
5 = <2.5% of North America (551 493 km²)
4 = 2.5 – 4.9% of North America
3 = 5 – 9.9% of North America
2 = 10 – 20% of North America
1 = >20% of North America (4 411 940 km²)

ND = Non-breeding Distribution
5 = highly restricted (≤130 000 km², or very restricted coastal areas, or interior uplands
4 = local (130 000 – 500 000 km² or ≤1600 km of coastline)
3 = intermediate (500 000 – 5 000 000 km², or along 1600 – 5000 km of coast)
2 = widespread (5 000 000 – 10 000 000 km², or along 5000 – 8000 km of coast)
1 = very widespread (10 000 000 – 18 000 000 km², or along 8000 – 14 500 km of coast)

Category and Rule

5 = Highly Imperiled: All species listed as threatened or endangered nationally, plus all species with significant population declines and either low populations or some other high risk factor.
a. PT = 5 and RA, BD, TB, or TN = 5

4 = Species of High Concern: Populations of these species are known or thought to be declining, and have some other known or potential threat as well: a. PT = 4 or 5 and either RA, BD, TB, or TN = 4 or 5; b. RA = 4 or 5 and either TB or TN = 4 or 5

3 = Species of Moderate Concern: Populations of these species are either a) declining with moderate threats or distributions; b) stable with known or potential threats and moderate to restricted distributions; c) and d) relatively small and restricted; or e) declining but with no other known threats: a. PT = 4 or 5 and RA, BD, ND, TN, or TB = 3; b. PT = 3 and RA, BD, ND, TN, or TB = 4 or 5; c. RA = 3 and BD or ND = 4 or 5; d. RA = 4 and BD and ND <4; e. PT = 5 and RA, BD, ND, TN, or TB > 1

2 = Species of Low Concern: Populations of these species are either a) stable with moderate threats and distributions; b) increasing but with known or potential threats and moderate to restricted distributions; or c) of moderate size: a. PT = 3 and RA, BD, ND, TN, or TB = 3; b. PT = 2 and RA, BD, ND, TN, or TB = 4 or 5; c. RA = 3

1 = Species Not at Risk: All other species

For more information on the Canadian Shorebird Conservation Plan contact:

Garry Donaldson
Canadian Shorebird Conservation Plan Coordinator
Canadian Wildlife Service
351 St. Joseph Blvd., 3rd Floor
Hull, Quebec
K1A 0H3

garry.donaldson@ec.gc.ca
(819) 953-3166

or

H. Loney Dickson
Canadian Shorebird Conservation Plan national working group
Canadian Wildlife Service
200, 4999-98th Ave.
Edmonton, Alberta
T6B 2X3

loney.dickson@ec.gc.ca
(780) 951-8851